

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A disk drive apparatus for controlling, under supply of a predetermined rating voltage of power voltage, a head drive section to position a head in a radial direction of an information recording disk and carry out a write and/or read operation of information while rotatively driving the information recording disk by a rotation drive motor, ~~the said disk drive apparatus including~~ comprising:

a forcible restoring section for controlling ~~the said~~ head drive section to forcibly bring said head to a retract position when said power voltage goes below a first voltage level; and

a normal restoring section for controlling said head drive section to move said head toward said retract position on the basis of said power voltage while said power voltage is smaller than said rating voltage but greater than said first voltage level.

2. (Currently amended) A disk drive apparatus according to claim 1, wherein said information recording disk ~~is~~ comprises a magnetic disk.

3. (Currently amended) A disk drive apparatus according to claim 2, wherein said head ~~is~~ comprises a magnetic head, and said retract position ~~has~~ includes a ramp provided for said magnetic head to run thereon.

4. (Currently amended) A disk drive apparatus according to claim 1, wherein said power voltage ~~is~~ comprises a voltage based on a battery voltage of a vehicle-mounted battery to be charged by a generator operating responsive to rotation of a vehicle-mounted engine.

5. (Currently amended) A disk drive apparatus according to claim 4, ~~wherein further~~ comprising a microprocessor for operating said forcible restoring section and said normal restoring section ~~are operated by a microprocessor operating on~~ with said power voltage.

6. (Currently amended) A ~~vehicle-mounted navigation system including~~ a disk drive apparatus according to claim 4, wherein said recording disk has navigation information recorded thereon, and said apparatus is mounted in a vehicle.

7. (Currently amended) A disk drive apparatus according to claim 6, wherein ~~monitor is made on~~ only a battery voltage to said disk drive apparatus is monitored to detect variation in said power voltage.

8. (New) A disk drive apparatus for controlling, under supply of a power voltage, a position of a read/write head in a radial direction of an information recording disk, to bring the head to a periphery of the information recording disk under low power conditions, said disk drive apparatus comprising:

Q2
a rotation drive motor for rotating the information recording disk;
a head drive section for driving the head over the information recording disk;
a voltage value monitor for monitoring the value of the power voltage; and
a controller, responsive to the monitored value of the power voltage being above a first predetermined level, for providing the power voltage to said rotation drive motor to rotate the information recording disk and to said head drive section to drive the head in a first direction, wherein:

said controller is responsive to the monitored value of the power voltage being equal to or less than the first predetermined level and above a second predetermined level for providing the power voltage to said head drive section to drive the head toward the periphery of the information recording disk at a first speed.

9. (New) A disk drive apparatus according to claim 8, wherein said controller is further responsive to the monitored voltage being equal to or less than the second predetermined level for providing reverse electromotive force from said rotation drive motor to said head drive section to drive the head to the periphery of the information recording disk at a second speed.

10. (New) A disk drive apparatus according to claim 9, wherein the second speed is greater than the first speed.

11. (New) A disk drive apparatus according to claim 8, further comprising an information recording disk having navigation information recorded thereon.

12. (New) A disk drive apparatus as claimed in claim 8, further comprising a ramp adjacent the periphery of the disk for supporting said head when said head drive section is not driving the head.

13. (New) A disk drive apparatus as claimed in claim 8, wherein the power voltage is provided from a vehicle-mounted generator, and said voltage value monitor is adapted to monitor the voltage from the vehicle mounted generator.

14. (New) A disk drive apparatus, comprising:
a rotation drive motor for rotating an information recording disk;
a read/write head for reading and writing information on the information recording disk;
a head drive motor for driving the head over the information recording disk;
a voltage input for providing voltage to said rotation drive motor and to said head drive motor;
a voltage value monitor for monitoring the value of the voltage provided by said voltage input; and
a controller, responsive to the monitored voltage value being above a first predetermined level, for providing voltage from said voltage input to said rotation drive motor to rotate the information recording disk and to said head drive motor to drive the head in a first direction, wherein:
said controller is responsive to the monitored voltage value being equal to or less than the first predetermined level and above a second predetermined level for providing voltage from said voltage input to said head drive motor to drive the head toward the periphery of the information recording disk at a first speed.

15. (New) A disk drive apparatus as claimed in claim 14, wherein said controller is further responsive to the monitored voltage value being equal to or less than the second predetermined level for providing reverse electromotive force from said rotation drive motor to said head drive motor to drive the head to the periphery of the information recording disk at a second speed.

16. (New) A disk drive apparatus according to claim 15, wherein the second speed is greater than the first speed.

17. (New) A disk drive apparatus according to claim 14, further comprising an information recording disk having navigation information recorded thereon.

18. (New) A disk drive apparatus as claimed in claim 14, further comprising a ramp adjacent the periphery of the disk for supporting said head when said head drive section is not driving the head.

19. (New) A disk drive apparatus as claimed in claim 14, wherein said voltage input is adapted to receive voltage from a vehicle-mounted generator.

20. (New) A disk drive apparatus as claimed in claim 19, wherein said voltage value monitor is adapted to monitor the voltage from the vehicle mounted generator.

21. (New) A disk drive apparatus according to claim 14, wherein said controller comprises:

a head drive control circuit for controlling said head drive motor to drive the head to a desired position over the information recording disk; and

a processor for providing instructions to said head drive control circuit.

22. (New) A disk drive apparatus for controlling, under supply of a predetermined rating voltage of power voltage, a head drive section to position a head in a radial direction of an information recording disk and carry out a write and/or read operation of information while

rotatively driving the information recording disk by a rotation drive motor, said disk drive apparatus comprising:

first means for controlling said head drive section to forcibly bring said head to a retract position when said power voltage goes below a first voltage level; and

second means for controlling said head drive section to move said head toward said retract position on the basis of said power voltage when said power voltage is smaller than said rating voltage but greater than said first voltage level.

23. (New) A disk drive, comprising:

a rotation drive motor for rotating an information recording disk;

a head for reading and/or writing information onto and/or from the information recording disk;

a voltage input for receiving a predetermined rating voltage of a power voltage;

a detector for detecting an abrupt decrease in the power voltage;

a forcible restoring section, responsive to detection of an abrupt decrease in the power voltage to level less than a first predetermined level, for moving said head in a direction toward an outer periphery of the information recording disk under power of reverse electromotive force from said rotation drive motor; and

a normal restoring section, responsive to detection of an abrupt decrease in the power voltage to a second predetermined level, less than the rating voltage and equal to or greater than the first predetermined level, for moving said head in a direction toward an outer periphery of the disk under power of voltage from said voltage input.

24. (New) A method of controlling a head drive section to position a head in a radial direction of an information recording disk and carry out a write and/or read operation of information, said method comprising:

providing power voltage to a rotation drive motor to rotate the information recording disk;

in response to the power voltage falling to a value equal to or less than a first predetermined voltage value, moving the head toward a retract position under power of the power voltage; and

Serial No. 09/839,5398888
Docket No. PU01-0171

8

in response to the power voltage falling to a value equal to or less than a second
predetermined voltage value, less than the first predetermined voltage value, forcibly moving
the head to the retract position.
